BRAUERIA (Lunz am See. Austria) 27:4 (2000)

Water mites as parasites of Trichoptera: invitation for cooperation

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As far as known, nearly all species of the true freshwater mites (Hydrachnidia) are bound to host insects in a parasitic/phoretic relation during their larval stage. In contrast to former ideas, this is true also for interstitial- and spring-dwelling mite species, while the few ascertained exceptions are found mostly among inhabitants of stagnant waters (SMITH 1998). From a quantitative point of view the most important host insect group are the chironomid Diptera, but insects of nearly all orders with aquatic instars are parasitized, with the obvious exception of Ephemeroptera. So far, species from the following Trichopteran families have been found parasitized by Hydrachnidia larvae (from SMITH & OLIVER 1986): Philopotamidae, Polycentropodidae, Psychomyiidae, Hydropsychidae, Arctopsychidae, Rhyacophilidae, Glossosomatidae, Hydroptilidae, Brachycentridae, Limnephilidae, Lepidostomatidae, Sericostomatidae, Molannidae, Leptoceridae; the following genera have been found as parasites of Trichoptera: *Thyas, Thyopsella* (?), *Protzia* (Hydryphantidae); *Momonia, Stygomomonia* (?) (Momoniidae); *Sperchon* (Sperchontidae); *Atractides, Hygrobates* (Hygrobatidae); *Unionicola, Koenikea* (Unionicolidae); *Albia* (Aturidae).

In most cases, mite larvae were found attached to adults, but in Limnephilidae and Leptoceridae also to larvae, and in one case we found larvae attached to pupae of *Drusus* sp., together with the host enclosed in the pupal cocoon (GERECKE, unpublished).

The interlocking of life cycles of water mites and their hosts is an interesting, and in the case of Trichoptera, little studied field of synecological research. Our general knowledge of the morphology and behaviour of water mite larvae is very incomplete and cannot be seriously improved without the help of specialists of the insect host groups.

Water mite larvae parasiting Trichoptera, and also representatives of other insect orders, should be treated as follows:

1.1 At best leave them on the host in a tube with complete collecting site recording and host determination labels, – also the attachment sites of the mites because of the ease with which they detach during conservation and transport. Attachment sites are important information as representatives of different mite taxa often have preferred places on their hosts, and sometimes different mite species have their specific niches on the same host individual.

1.2 If the host should remain in the collector's material, detach the mites carefully and put them into a separate vial, giving on the label collecting site, host species and attachment sites. In any case, avoid collecting site labels that contain collecting site numbers only, without precise locality identification.

2. Water mite larvae need not be preserved necessarily in Koenike's fluid, the classical water mite preserving mixture (glycerine : acetic acid : distilled water 10:3:6). They can be studied from alcohol preserved material as well. Formaldehyde-fixed specimens are more difficult to study due to the contraction of idiosoma appendages. However they can be successfully softened by warming for several days in acetic acid of 50°C. In general, at this point we should put an end to the story that water mites cannot be studied if they are preserved in alcohol or glycerine. The fact is that material from Koenike's fluid can be prepared more easily, but it is by no means impossible to identify adults, nymphs and larvae that have been preserved in other liquids (with the single exception of *Arrenurus* females which lose characters in the genital area).

3. Put the mite vials in a box and contact a water mite specialist if you have a certain number of specimens and data collected (or if there are special questions). There is no hurry with the material, and a study on this theme cannot start before consistent material from many different sites and hosts is available. But you should keep in mind that these mites are interesting, little studied animals and treat them as such.

4. The following points are of particular interest:

4.1 Finds in isolated sites (desert habitats, high mountain spring areas, small islands). Such records allow to encircle the range of potential mite taxa and sometimes to find a kind of natural laboratory suitable for detailed life cycle studies.

4.2 Data on particularly intense parasitization (both regarding numbers of mites per host individual and frequency of parasitism in a population). Such observations could serve as starting points for an investigation project, while studies on host-parasite relations with a low parasitism rate are difficult.

4.3 Records of Trichoptera families so far not known as mite hosts (see above).

5. In any case, information on the general composition of the Trichoptera fauna at the collecting site could be of interest (those species not attacked by mites may be of use in understanding the host-searching strategy).

6. Clearly, parallel collecting of adult mites in water bodies would be of great help, especially in remote areas. You should pay particular attention to slowly moving, orange-red, soft-bodied mites in mosses and hygropetric habitats on stones (Hydryphantidae). As has been reported for the standing-water dwelling mite Limnesia maculosa (BOETTGER 1969), also these mites can be found accumulating and feeding on egg clutches of Trichoptera (GERECKE, unpublished).

References

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Wallace J. Morse 1916-1999

Trichoptera and Odonata workers will be saddened to learn that Mr. Wallace „Wally" J. Morse died on 8 January 1999 at Dover Rehabilitation Center, Dover, New Hampshire after a long illness. He was 82 years old. He was employed by the University of New Hampshire as a research entomologist and was the Entomology Department's museum curator for 38 years until he retired in 1981. A more complete obituary may be found in Foster's Daily Democrat, Dover, New Hampshire, Monday evening, January 11, 1999. Mr. Morse published at least the following Trichoptera papers in his career:

BLICKLE,R.L., and W.J.MORSE, 1954, New species of Hydroptilidae (Trochoptera). Bulletin of the Brooklyn Entomological Society 49:121-127.

BLICKLE,R.L., and W.J.MORSE, 1955, New and little known Polycentropus (Trichoptera). Bulletin of the Brooklyn Entomological Society 50:95-98.

BLICKLE,R.L., and W.J.MORSE, 1957, New Hydroptilidae (Trichoptera) from New Hampshire. Bulletin of the Brooklyn Entomological Society 52:48-50.

BLICKLE,R.L., and W.J.MORSE, 1966, The caddisflies (Trichoptera) of Maine, excepting the family Hydroptilidae. maine Agricultural Experiment Station, Orono, Maine, Bulletin T-24, 12 pages.

MORSE,W.J., and R.L.BLICKLE, 1953, A check list of the Trichoptera (Caddis flies) of New Hampshire. Entomological News 64:68-73, 97-102.

MORSE,W.J., and R.L.BLICKLE, 1957, Additions and corrections on New Hampshire Trichoptera. Entomological News 68:127-131.

Mr.Morse had no family relation with me.
According to John Weaver, Wally Morse's colleague, Dr.Robert L. Blickle, was 85 years old a couple of months ago.

John Morse